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10 December 2009

*Via electronic and overnight mail (Tracking No. IZA9788W0192385931)*

Mr. Michael Jacobi  
Office of Remediation (3LC20)  
U.S. Environmental Protection Agency Region III  
1650 Arch Street  
Philadelphia, PA 19103-2029

**RE: Interim Tentatively Identified Compound (TIC) Submittal**

Hercules Incorporated – Aqualon Division  
Hopewell, Virginia  
EPA ID: VAD003121928

Dear Mr. Jacobi:

On behalf of Hercules Incorporated –Aqualon Division (Hercules), Groundwater & Environmental Services, Inc. (GES) is presenting this Interim Tentatively Identified Compound (TIC) Submittal to the United States Environmental Protection Agency (USEPA) for the Hercules facility in Hopewell, Virginia in support of the Facility Lead Corrective Action Program. As discussed at the 9 November 2009 site meeting, this Interim TIC Submittal has been prepared for the USEPA's review and concurrence prior to the determination of toxicity values that will be incorporated into the human health and ecological risk assessments for the site.

**APPROACH**

The process proposed for TIC class identification and establishment of toxicity values for the TICs is consistent with the approach proposed to USEPA in the meeting held in the fall of 2008. The attached interim submittal, prepared by Dr. Bruce Fishman of RBR Consulting, Inc., is intended to gain USEPA's formal concurrence prior to the incorporation of the toxicity data for the TICs into the risk evaluations.

The approach used to identify the probable chemical class for each TIC consisted of the following steps:

- ✓ review of each laboratory data sheet and chromatogram containing a TIC;
- ✓ categorization of the TICs into groups or classes based on their chromatograms;
- ✓ comparison of each TIC class to known similar substances based on structure-activity relationships; and
- ✓ establishment of the closest match between each TIC class and the closest known surrogate to allow the establishment of a toxicity value for each TIC class based on the toxicity of the surrogate.

### **PATH FORWARD**

Upon receipt of USEPA's concurrence of the chemical/chemical class for each TIC, GES and RBR will proceed with the development of the quantitative human health and ecological risk assessments. The following additional steps will be conducted:

- ✓ development of a master table containing each sample, the TICs in each sample, the surrogates employed for each TIC in each sample, and the toxicity values employed for each TIC in each sample; and
- ✓ incorporation of the surrogate toxicity value for each TIC in each sample into the risk assessment.

For the human health risk evaluation, a toxicity value will be assigned for each TIC class. The assigned reference dose will be used to quantify potential hazard for that TIC class and cumulated with other relevant endpoints as appropriate.

For the ecological risk evaluation, it is not anticipated that there will be any existing risk characterization data for any ecological receptor for any TIC. A literature review will be conducted for each TIC class and each relevant receptor group in an attempt to identify the magnitude of toxicity for the TICs with respect to the receptor group and habitat. In cases where there is an absence of toxicity information, information from surrogate substances will be employed to allow a quantitative ecological hazard quotient to be calculated.

It should be noted that the chemical/chemical classes identified for each TIC within the attached interim submittal are consistent with constituents that might be expected to be present at the Hercules facility. Should you have any questions regarding the enclosed information, please give me a call at 866-222-7786 (ext. 3771).

Respectfully submitted,  
**Groundwater & Environmental Services, Inc.**

A handwritten signature in black ink that reads "Montgomery S. Bennett".

Montgomery S. Bennett, P.G.  
*Senior Project Manager*

Attachment: Memo dated 8 December 2009 re: Class Selection for Unknown Tentatively Identified Compounds

cc: Mr. Steve Spence, Hercules  
Mr. Bill Perkinson, Hercules  
Mr. Bruce Fishman, RBR

**Risk-Based Remedies**

**RBR Consulting, Inc.**

650 Shady Drive  
Beaver Falls, PA 15010

Phone: 724-846-4096  
Fax: 724-846-6974

**MEMORANDUM**

**TO:** Monty Bennett  
GES Corporation

**CC:** Erin Wright  
GES Corporation

**FROM:** Bruce Fishman

**DATE:** December 08, 2009

**SUBJECT:** Class Selection for Unknown Tentatively Identified Compounds  
Hercules Incorporated Facility, Hopewell, Virginia

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This memorandum presents the proposed class selection for the unknown Tentatively Identified Compounds (TIC) detected in soil/sediment and groundwater samples at the Hercules Incorporated Facility located in Hopewell, Virginia (site). A proposed process to evaluate the unknown TICs was presented to the United States Environmental Protection Agency (USEPA) during a teleconference on October 9, 2008 and also during the meeting in Philadelphia on October 22, 2008. Specifically, the agreed upon TIC evaluation process includes the grouping of unknown TICs into chemical classes, which will allow the establishment of toxicity values (reference doses) for each chemical/chemical class, thus allowing a risk-based screening to eliminate innocuous or de minimis chemicals/chemical classes, and incorporation of remaining chemicals/chemical classes into a site-specific risk assessment (see flow chart presented as Attachment A).

The first step of the TIC evaluation process, the grouping of unknown TICs into chemical classes, has been completed and is presented in this memorandum.

**Grouping of Unknown TICs into Chemical Classes**

Unknown TICs are detected in soil/sediment samples collected from the vacuum filter sludge pile, the eastern whitewater lagoon, the western whitewater lagoon, and the old landfill and landfill 156 area. Unknown TICs are also detected in groundwater samples from the whitewater lagoon wells and the main holding basin area wells. A summary of the unknown TICs is presented in Tables 1 through 6 for each of these areas, respectively. Specifically, these tables present the samples in which unknown TICs were detected and associated analytical method, the type of TIC (e.g., unknown, unknown alkene, unknown ketone), the concentration of the unknown TIC in units of ug/Kg or ug/L, and the retention time in minutes. This information was obtained directly from the laboratory analytical reports. It should be noted that unknown TICs are not detected in soil/sediment

## **RBR Consulting, Inc.**

samples collected from others areas of the site, including the sludge drying beds, natrosol lagoon area, East and West Bears Creeks, Bailey Creek, Cattail Creek, and the unnamed tributary. Similarly, unknown TICs are not detected in groundwater samples collected from any monitoring wells associated with the old landfill and landfill 156 area, the natrosol lagoon area, the Reten/Aqualon basin area, the sludge drying beds, or the vacuum filter sludge pile.

In order to group each TIC into a chemical class, a probable identity for each unknown TIC was determined. This process included conducting a detailed review of the raw sample data from the laboratory analytical reports. Specifically, the gas chromatography/mass spectrometry (GC/MS) output scans were reviewed. The scans for the unknown TICs were reviewed for the most prominent defining characteristics, such as number and location of peaks and magnitude of peaks. These prominent features were then matched to the extent possible with scans of known constituents that were also provided in the laboratory reports. The resulting probable identity for each unknown TIC is provided in Tables 1 through 6.

After each unknown TIC was matched with a probable identity, the TICs were grouped into chemical classes. Chemical classes were assigned by reviewing the molecular structure of the probable TIC identity. A total of 69 chemicals/chemical classes, were identified as being representative of unknown TICs detected at the site as summarized below:

### **Chemicals/Chemical Classes**

- 2-ethoxy propane
- acetaldehyde
- alcohol ether
- aliphatic alcohol
- aliphatic alkane ring
- alkane
- alkane ether
- alkane ring
- alkene
- alkene chain
- alkyl alcohol
- alkyl aromatic
- alkyl aromatic ring
- alkyl chain
- alkyl ether
- alkyl ketone
- alkyl ring
- alkyl silicon
- alkylated benzene
- anisole
- aristolones
- aromatic ring
- benzofuroxane derivative
- bichromenes
- brominated alkyl ring

- butyl amine
- butyl ether
- carbamic acid ester
- carbon chains
- carbon dioxide
- carbon disulfide
- chlorinated benzene
- chlorinated volatile organic compound
- cinnamic acids
- cyclic aldehyde
- dichlorobenzene
- ether alcohol
- ethyl chloride
- ethyl ether
- ethyl lactate
- ethylene oxide
- eureponosols
- fluorinated volatile organic compound
- galactose derivative
- glycol ether derivative
- guienes
- hydrazine derivative
- imidazole
- lupenone related
- mercaptan
- methacrylate derivative
- methyl benzene
- methyl methacrylate
- organic disulfide
- phenol
- phosphine
- Polycyclic aromatic hydrocarbon
- propane
- propylene glycol
- quinoline derivative
- sitosterol
- succinic acid derivative
- sulfur dioxide
- sulfurated alkyl acid
- sulfurated glycol ether
- terpene derivative
- tert butyl ether
- tetrazene derivative
- trihexyls

**Risk-Based Remedies**

**RBR Consulting, Inc.**

The attached table presents all of the TICs with the most likely chemical/chemical class identified for each TIC. These now-identified chemicals/chemical classes are consistent with constituents that might be expected to be present at a facility of this type.

It should be noted that the laboratory included unknown TIC results for an unknown aldol condensate on several occasions. Further discussion with the laboratory indicated that the unknown aldol condensate is an artifact of the extraction process. Therefore, results for the unknown aldol condensate will not be included in the site-specific risk assessment. In addition, it should be noted that several of the unknown TIC results are "B" qualified. The "B" qualifier indicates that the constituent was not detected substantially above the level of the associated method blank/preparation or field blank. Therefore, "B" qualified constituents are not expected to be present at the site. Although "B" qualified results will be included in the site-specific risk assessment, their inclusion may be limited to a qualitative discussion.

Upon concurrence of this list with USEPA, RBR will proceed to assign toxicity values (reference doses) for the TIC classes. Upon completion of that task, the TICs will be incorporated into the site-specific risk assessment.

## **TABLES**

**TABLE 1**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**VACUUM FILTER SLUDGE PILE**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
VFSP-1	8270C-TIC	Aldol Condensate	79000 B	3.72	Extraction artifact	- - -	none
VFSP-1	8270C-TIC	Unknown	7900 J	14.02	5.alpha.-ergost-8(14)-ene	6673-69-4	sitosterol
VFSP-1	8270C-TIC	Unknown	23000 J	14.43	gamma-sitosterol	83-47-6	sitosterol
VFSP-1	8270C-TIC	Unknown	8800 J	15.92	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-1	8270C-TIC	Unknown	27000 J	16.39	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-1	8270C-TIC	Unknown	24000 J	16.58	D:C-Friedoolean-8-en-3-one	22611-26-3	lupenone related
VFSP-1	8270C-TIC	Unknown	8700 J	16.81	Stigmastan-7-one	55331-88-9	sitosterol
VFSP-1	8270C-TIC	Unknown	16000 J	16.91	Olean-12-ene	471-68-1	lupenone related
VFSP-1	8270C-TIC	Unknown	38000 J	17.12	alpha-amyrin	638-95-9	lupenone related
VFSP-2	8270C-TIC	Aldol Condensate	11000 B	3.72	Extraction artifact	- - -	none
VFSP-2	8270C-TIC	Unknown	2500 J	15.92	Azulene,1,2,3,5,6,7,8,8a-octahydro-1,4-dimethyl-7-(1-methylethyl)-	3691-11-0	guienes
VFSP-2	8270C-TIC	Unknown	3700 J	16.25	gamma-sitosterol	83-47-6	sitosterol
VFSP-2	8270C-TIC	Unknown	1900 J	16.32	gamma-sitosterol	83-47-6	sitosterol
VFSP-2	8270C-TIC	Unknown	2700 J	16.39	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-2	8270C-TIC	Unknown	1000 J	16.59	Olean-12-ene	471-68-1	lupenone related
VFSP-2	8270C-TIC	Unknown	1400 J	16.81	2H-1-benzopyran-5-ol, 2-methyl-2-(4-methyl-3-pentenyl)-7-pentyl	18793-28-7	bichromenes
VFSP-2	8270C-TIC	Unknown	2400 J	16.92	Olean-12-ene	471-68-1	lupenone related
VFSP-2	8270C-TIC	Unknown	1600 J	17.18	benzene, 1-(chloromethyl)-3-methoxy-5-methyl-, trichloro	74313-16-9	chlorinated benzene
VFSP-3	8270C-TIC	Aldol Condensate	47000 B	3.72	Extraction artifact	- - -	none
VFSP-3	8270C-TIC	Unknown	8800 J	14.43	gamma-sitosterol	83-47-6	sitosterol
VFSP-3	8270C-TIC	Unknown	12000 J	16.92	alpha-amyrin	638-95-9	lupenone related
VFSP-4	8270C-TIC	Aldol Condensate	38000 B	3.72	Extraction artifact	- - -	none
VFSP-4	8270C-TIC	Unknown	5100 J	14.11	4.alpha.,5-cyclo-a-homo-5.alpha.-cholestan-3-one	0-00-0	sitosterol
VFSP-4	8270C-TIC	Unknown	4200 J	14.17	5.alpha.-ergost-8(14)-ene	6673-69-4	sitosterol
VFSP-4	8270C-TIC	Unknown	28000 J	14.42	gamma-sitosterol	83-47-6	sitosterol
VFSP-4	8270C-TIC	Unknown	15000 J	16.58	D:C-Friedoolean-8-en-3-one	22611-26-3	lupenone related
VFSP-4	8270C-TIC	Unknown	26000 J	17.12	5(1H)-Azulenone,2,4,6,7,8,8a-hexahydro-3,8-dimethyl-4-(1-methylethylidene)-	6754-66-1	guienes
VFSP-5	8270C-TIC	Aldol Condensate	33000 B	3.72	Extraction artifact	- - -	none
VFSP-5	8270C-TIC	Unknown	3700 J	10.85	4,7-methanoazulene,decahydro-1,4,9,9-tetramethyl-	20478-88-0	guienes
VFSP-5	8270C-TIC	Unknown	6700 J	15.91	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-5	8270C-TIC	Unknown	5400 J	16.31	9H-thioxanthene, 2-chloro-	92-38-6	trihexyls
VFSP-5	8270C-TIC	Unknown	6500 J	16.59	D-Norandrostan-16-ol, acetate, (5.alpha.,16.beta.)-	54411-62-0	sitosterol
VFSP-5	8270C-TIC	Unknown	4800 J	16.81	cholestan-3-one, 4,4-dimethyl-, (5.alpha.)-	2097-85-0	sitosterol

**TABLE 1**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**VACUUM FILTER SLUDGE PILE**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
VFSP-6	8270C-TIC	Aldol Condensate	23000 B	3.72	Extraction artifact	- - -	none
VFSP-6	8270C-TIC	Unknown	13000 J	14.42	gamma-sitosterol	83-47-6	sitosterol
VFSP-6	8270C-TIC	Unknown	16000 J	15.91	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-6	8270C-TIC	Unknown	8100 J	16.31	Stigmasterol	83-48-7	sitosterol
VFSP-6	8270C-TIC	Unknown	35000 J	16.39	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-6	8270C-TIC	Unknown	27000 J	16.59	Urs-12-ene	464-97-1	lupenone related
VFSP-6	8270C-TIC	Unknown	8900 J	16.81	Naphtho[2,3-b]furan-9(4H)-one, 4a,5,6,7,8a-hexahydro-3,4a,5-trimethyl-[4a	15404-32-7	eureoponosols
VFSP-6	8270C-TIC	Unknown	43000 J	17.12	Urs-12-ene	464-97-1	lupenone related
VFSP-7	8270C-TIC	Aldol Condensate	41000 B	3.72	Extraction artifact	- - -	none
VFSP-7	8270C-TIC	Unknown	16000 J	10.85	d:a-Friedouran-3-one	0-00-0	sitosterol
VFSP-7	8270C-TIC	Unknown	17000 J	10.88	4-Decyne	2384-86-3	carbon chains
VFSP-7	8270C-TIC	Unknown	18000 J	14.43	gamma-sitosterol	83-47-6	sitosterol
VFSP-7	8270C-TIC	Unknown	29000 J	16.59	D-Norandrostan-16-ol, acetate, (5.alpha.,16.beta.)-	54411-62-0	sitosterol
VFSP-7	8270C-TIC	Unknown	53000 J	17.13	alpha-amyrin	638-95-9	lupenone related
VFSP-8	8270C-TIC	Aldol Condensate	37000 B	3.71	Extraction artifact	- - -	none
VFSP-8	8270C-TIC	Unknown	11000 J	14.40	gamma-sitosterol	83-47-6	sitosterol
VFSP-8	8270C-TIC	Unknown <sup>1</sup>	16000 J	15.88	Naphthalene, decahydro-4a-methyl-1-methy	17066-67-0	alkyl aromatic
VFSP-8	8270C-TIC	Unknown <sup>1</sup>	23000 J	16.35	Ergostanol	1694036	sitosterol
VFSP-8	8270C-TIC	Unknown <sup>1</sup>	18000 J	16.55	D:C-Friedoolean-3-one	5945-53-9	terpene derivative
VFSP-9	8270C-TIC	Aldol Condensate	17000 B	3.72	Extraction artifact	- - -	none
VFSP-9	8270C-TIC	Unknown	3300 J	14.42	gamma-sitosterol	83-47-6	sitosterol
VFSP-9	8270C-TIC	Unknown	2800 J	15.92	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
VFSP-9	8270C-TIC	Unknown	8000 J	16.59	Urs-12-ene	464-97-1	lupenone related
VFSP-9	8270C-TIC	Unknown	1900 J	16.80	cholestan-3-one, 4,4-dimethyl-, (5.alpha.)-	2097-85-0	sitosterol
VFSP-9	8270C-TIC	Unknown	13000 J	17.12	5(1H)-Azulene,2,4,6,7,8,8a-hexahydro-3,8-dimethyl-4-(1-methylethylidene)-	6754-66-1	guienes

Notes:

ug/Kg = micrograms per kilogram.

TIC = Tentatively Identified Compound.

B = The compound / analyte was not detected substantially above the level of the associated method blank / preparation or field blank.

J = The positive result for this analyte is a quantitative estimate.

<sup>1</sup> = The compound/analyte was identified during laboratory processes but determined unknown by a data validator. The analyte was later reidentified.

**TABLE 2**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**EASTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
ELSS-1A	8260B-TIC	Unknown	60 J	1.17	propane	74-98-6	propane
ELSS-1A	8260B-TIC	Unknown	290 J	1.35	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-1A	8260B-TIC	Unknown	53 J	1.51	carbon dioxide	124-38-9	carbon dioxide
ELSS-1A	8260B-TIC	Unknown	57 J	1.58	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-1A	8260B-TIC	Unknown	110 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-1A	8260B-TIC	Unknown	28 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-1A	8260B-TIC	Unknown Alkene	130 J	8.06	1,4-dichlorobenzene-d4	3855-82-1	dichlorobenzene
ELSS-1A	8270C-TIC	Unknown Aldol Condensate	5300 A	2.77	Extraction artifact	- - -	none
ELSS-1B	8260B-TIC	Unknown	1000 J	1.15	Extraction artifact	- - -	none
ELSS-1B	8260B-TIC	Unknown	64 J	1.38	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-1B	8260B-TIC	Unknown	18 J	1.51	acetaldehyde	75-07-0	acetaldehyde
ELSS-1B	8260B-TIC	Unknown	13 J	1.58	methanethiol	74-93-1	mercaptan
ELSS-1B	8260B-TIC	Unknown	37 B	1.72	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-1B	8260B-TIC	Unknown	9.9 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-1B	8260B-TIC	Unknown	9.1 J	2.45	carbon dioxide	124-38-9	carbon dioxide
ELSS-1B	8260B-TIC	Unknown Alkene	14 J	4.93	spiro[3.3]hepta-1,5-diene	22635-78-5	alkene
ELSS-1B	8270C-TIC	Unknown Aldol Condensate	1400 A	2.78	Extraction artifact	- - -	none
ELSS-2A	8260B-TIC	Unknown	36 J	1.04	carbon dioxide	124-38-9	carbon dioxide
ELSS-2A	8260B-TIC	Unknown	85 J	1.17	Cyclopropyl carbinol	2516-33-8	alkyl alcohol
ELSS-2A	8260B-TIC	Unknown	69 J	1.38	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-2A	8260B-TIC	Unknown	72 J	1.43	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-2A	8260B-TIC	Unknown	91 J	1.51	carbon dioxide	124-38-9	carbon dioxide
ELSS-2A	8260B-TIC	Unknown	32 J	1.61	Ethyl chloride	75-00-3	Ethyl chloride
ELSS-2A	8260B-TIC	Unknown	38 J	1.73	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-2A	8260B-TIC	Unknown	32 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-2A	8270C-TIC	Unknown Aldol Condensate	5200 A	2.77	Extraction artifact	- - -	none
ELSS-2A	8270C-TIC	Unknown Alcohol	2400 J	15.28	cholestan-3-ol, 6-methyl-, (3.beta.,5.alpha.,6.alpha.)-	43217-64-7	sitosterol
ELSS-2A	8270C-TIC	Unknown Ketone	2100 J	16.21	Pregn-4-en-3-one, 17,21-[(1,1-dimethylethyl)borylene]bis(oxy)]-20-hydroxy-,	30888-39-2	lupenone related
ELSS-2A	8270C-TIC	Unknown Alkene	3000 J	16.26	Tetracosapentaene, 2,6,10,15,19,23-hexamethyl-	26266-08-0	alkene
ELSS-2B	8260B-TIC	Unknown	19 J	1.50	carbon dioxide	124-38-9	carbon dioxide
ELSS-2B	8260B-TIC	Unknown	17 J	1.66	Ethyl chloride	75-00-3	Ethyl chloride
ELSS-2B	8260B-TIC	Unknown	15 J	1.70	carbon dioxide	124-38-9	carbon dioxide
ELSS-2B	8260B-TIC	Unknown	16 J	1.87	carbon dioxide	124-38-9	carbon dioxide
ELSS-2B	8260B-TIC	Unknown	16 J	2.03	carbon dioxide	124-38-9	carbon dioxide
ELSS-2B	8260B-TIC	Unknown	15 J	2.18	2-pentanone, 4-hydroxy-4-methyl-	123-42-2	alkyl ketone
ELSS-2B	8260B-TIC	Unknown	15 J	2.31	carbon dioxide	124-38-9	carbon dioxide
ELSS-2B	8260B-TIC	Unknown	18 J	2.46	carbon dioxide	124-38-9	carbon dioxide
ELSS-2B	8270C-TIC	Unknown Aldol Condensate	1100 A	2.78	Extraction artifact	- - -	none
ELSS-2B	8270C-TIC	Unknown Aldol Condensate	280 A	2.82	Extraction artifact	- - -	none

**TABLE 2**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**EASTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
ELSS-3A	8260B-TIC	Unknown	62 J	1.04	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-3A	8260B-TIC	Unknown	1300 J	1.35	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-3A	8260B-TIC	Unknown	170 J	1.63	Ethyl chloride	75-00-3	ethyl chloride
ELSS-3A	8260B-TIC	Unknown	240 J	1.73	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-3A	8260B-TIC	Unknown	140 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-3A	8260B-TIC	Unknown	180 J	2.41	carbon disulfide	75-15-0	carbon disulfide
ELSS-3A	8260B-TIC	Unknown	200 B	2.47	carbon disulfide	75-15-0	carbon disulfide
ELSS-3A	8270C-TIC	Unknown Aldol Condensate	8900 A	2.77	Extraction artifact	- - -	none
ELSS-3A	8270C-TIC	Unknown Aldol Condensate	3300 A	2.80	Extraction artifact	- - -	none
ELSS-3A	8270C-TIC	Unknown	1800 J	15.28	ethyl chrysanthemate	20536-40-7	alkyl ring
ELSS-3A	8270C-TIC	Unknown	1800 J	16.20	ethyl chrysanthemate	20536-40-7	alkyl ring
ELSS-3A	8270C-TIC	Unknown	1400 J	16.27	ethyl chrysanthemate	20536-40-7	alkyl ring
ELSS-3B	8260B-TIC	Unknown	560 J	1.17	Extraction artifact	- - -	none
ELSS-3B	8260B-TIC	Unknown	32 J	1.33	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-3B	8260B-TIC	Unknown	120 J	1.36	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-3B	8260B-TIC	Unknown	40 J	1.51	carbon dioxide	124-38-9	carbon dioxide
ELSS-3B	8260B-TIC	Unknown	25 J	1.58	Ethyl chloride	75-00-3	Ethyl chloride
ELSS-3B	8260B-TIC	Unknown	87 B	1.72	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-3B	8270C-TIC	Unknown Aldol Condensate	2000 A	2.78	Extraction artifact	- - -	none
ELSS-3B	8270C-TIC	Unknown Aldol Condensate <sup>1</sup>	260 T	3.35	Ethane, 1,1,2,2-tetrachloro-	79-34-5	chlorinated volatile organic compound
ELSS-4A	8260B-TIC	Unknown	86 J	1.04	carbon dioxide	124-38-9	carbon dioxide
ELSS-4A	8260B-TIC	Unknown	200 J	1.17	carbon dioxide	124-38-9	carbon dioxide
ELSS-4A	8260B-TIC	Unknown	52 J	1.39	carbon dioxide	124-38-9	carbon dioxide
ELSS-4A	8260B-TIC	Unknown	52 J	1.51	carbon dioxide	124-38-9	carbon dioxide
ELSS-4A	8260B-TIC	Unknown	84 J	2.01	carbon dioxide	124-38-9	carbon dioxide
ELSS-4A	8260B-TIC	Unknown	53 J	2.13	carbon disulfide	75-15-0	carbon disulfide
ELSS-4A	8260B-TIC	Unknown	140 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-4A	8260B-TIC	Unknown	61 J	2.44	carbon dioxide	124-38-9	carbon dioxide
ELSS-4A	8270C-TIC	Unknown Aldol Condensate	7100 A	2.78	Extraction artifact	- - -	none
ELSS-4A	8270C-TIC	Unknown Amine	3400 J	5.45	butanal	123-72-8	butyl amine
ELSS-4A	8270C-TIC	Unknown	2800 J	9.68	3-octadecyne	61886-64-4	alkene
ELSS-4A	8270C-TIC	Unknown	2900 J	9.80	ethyl chrysanthemate	97-41-6	alkyl ring
ELSS-4A	8270C-TIC	Unknown Alkane	11000 J	9.92	bicyclo[2.2.2]octane, 1,2,3,6-tetramethyl-	62338-45-8	alkyl ring
ELSS-4A	8270C-TIC	Unknown PAH	4500 J	10.92	phenanthrene, 1-methyl-7-(1-methylethyl)-	483-65-8	PAH
ELSS-4A	8270C-TIC	Unknown Alkene	2700 J	14.26	1-Heptadecene	6765-39-5	alkyl chain
ELSS-4A	8270C-TIC	Unknown	2600 J	14.58	spiro[7H-indeno[4,5-d]-1,3-dioxole-7,1'(2'H)-isoquinoline]-7',8-diol,3',4',6	30833-09-1	quinoline derivative
ELSS-4A	8270C-TIC	Unknown Ketone	2500 J	16.31	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
ELSS-4A	8270C-TIC	Unknown Alkene	3000 J	16.47	1,4-methanoazulene, 7-bromodecahydro-4,8,8-trimethyl-9-methylene-	24503-54-6	brominated alkyl ring

**TABLE 2**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**EASTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
ELSS-4B	8260B-TIC	Unknown	13 J	1.20	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-4B	8260B-TIC	Unknown	31 J	1.50	acetaldehyde	75-07-0	acetaldehyde
ELSS-4B	8260B-TIC	Unknown	13 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-4B	8260B-TIC	Unknown	23 J	2.41	carbon dioxide	124-38-9	carbon dioxide
ELSS-4B	8270C-TIC	Unknown Aldol Condensate	1400 A	2.78	Extraction artifact	---	none
ELSS-5A	8260B-TIC	Unknown	220 J	1.17	carbon dioxide	124-38-9	carbon dioxide
ELSS-5A	8260B-TIC	Unknown	410 J	1.39	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-5A	8260B-TIC	Unknown	78 J	1.51	carbon dioxide	124-38-9	carbon dioxide
ELSS-5A	8260B-TIC	Unknown	91 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-5A	8260B-TIC	Unknown	100 J	2.00	carbon dioxide	124-38-9	carbon dioxide
ELSS-5A	8260B-TIC	Unknown	70 J	2.18	carbon dioxide	124-38-9	carbon dioxide
ELSS-5A	8260B-TIC	Unknown	120 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-5A	8260B-TIC	Unknown	130 B	2.47	carbon disulfide	75-15-0	carbon disulfide
ELSS-5A	8270C-TIC	Unknown Aldol Condensate	7800 A	2.77	Extraction artifact	---	none
ELSS-5A	8270C-TIC	Unknown Amine	7200 J	5.44	2-ethoxyethyl methacrylate	2370-63-0	methacrylate derivative
ELSS-5A	8270C-TIC	Unknown PAH	3300 J	9.92	anthracene, 9-cyclohexyltetradecahydro-	55255-70-4	PAH
ELSS-5A	8270C-TIC	Unknown	2400 J	16.46	disulfide, diphenyl	882-33-7	organic disulfide
ELSS-5A	8270C-TIC	Unknown Alkene	1600 J	16.75	beta-amyrin	559-70-6	terpene derivative
ELSS-5B	8260B-TIC	Unknown	9.8 J	1.04	carbon dioxide	124-38-9	carbon dioxide
ELSS-5B	8260B-TIC	Unknown	67 J	1.39	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-5B	8260B-TIC	Unknown	29 J	1.51	acetaldehyde	75-07-0	acetaldehyde
ELSS-5B	8260B-TIC	Unknown	12 J	1.56	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-5B	8260B-TIC	Unknown	31 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
ELSS-5B	8260B-TIC	Unknown	10 J	2.30	carbon disulfide	75-15-0	carbon disulfide
ELSS-5B	8260B-TIC	Unknown	14 B	2.47	carbon disulfide	75-15-0	carbon disulfide
ELSS-5B	8270C-TIC	Unknown Aldol Condensate	1500 A	2.78	Extraction artifact	---	none

Notes:

ug/Kg = micrograms per kilogram.

TIC = Tentatively Identified Compound.

A = The tentatively identified compound is a suspected aldol-condensation product.

B = The compound / analyte was not detected substantially above the level of the associated method blank / preparation or field blank.

J = The positive result for this analyte is a quantitative estimate.

T = The tentatively identified compound is a targeted analyte of another analysis fraction.

<sup>1</sup> = The compound/analyte was identified during laboratory processes but determined unknown by a data validator. The analyte was later reidentified.

**TABLE 3**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**WESTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
WLSS-1A	8260B-TIC	Unknown	780 J	1.37	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-1A	8260B-TIC	Unknown	150 J	1.51	acetaldehyde	75-07-0	acetaldehyde
WLSS-1A	8260B-TIC	Unknown	240 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-1A	8260B-TIC	Unknown	130 J	2.30	carbon disulfide	75-15-0	carbon disulfide
WLSS-1A	8260B-TIC	Unknown	150 J	2.36	carbon disulfide	75-15-0	carbon disulfide
WLSS-1A	8260B-TIC	Unknown	140 J	2.41	carbon disulfide	75-15-0	carbon disulfide
WLSS-1A	8260B-TIC	Unknown	260 B	2.47	carbon disulfide	75-15-0	carbon disulfide
WLSS-1A	8260B-TIC	Unknown	120 J	2.57	carbon disulfide	75-15-0	carbon disulfide
WLSS-1A	8270C-TIC	Unknown Aldol Condensate	12000 A	2.78	Extraction artifact	- - -	none
WLSS-1A	8270C-TIC	Unknown Amine	2300 J	5.45	2-tetrazene, 1,1-dimethyl-4,4-bis(1-methylethyl)-	64113-41-3	tetrazene derivative
WLSS-1B	8260B-TIC	Unknown	70 J	1.36	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-1B	8260B-TIC	Unknown	36 J	1.51	acetaldehyde	75-07-0	acetaldehyde
WLSS-1B	8260B-TIC	Unknown	17 J	1.55	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-1B	8260B-TIC	Unknown	39 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-1B	8260B-TIC	Unknown	14 J	2.06	carbon dioxide	124-38-9	carbon dioxide
WLSS-1B	8260B-TIC	Unknown	17 J	2.41	carbon disulfide	75-15-0	carbon disulfide
WLSS-1B	8260B-TIC	Unknown	22 B	2.47	carbon disulfide	75-15-0	carbon disulfide
WLSS-1B	8260B-TIC	Unknown	15 J	2.53	carbon disulfide	75-15-0	carbon disulfide
WLSS-1B	8270C-TIC	Unknown Aldol Condensate	1800 A	2.77	Extraction artifact	- - -	none
WLSS-2A	8260B-TIC	Unknown	100 J	1.04	carbon dioxide	124-38-9	carbon dioxide
WLSS-2A	8260B-TIC	Unknown	690 J	1.39	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-2A	8260B-TIC	Unknown	510 J	1.51	acetaldehyde	75-07-0	acetaldehyde
WLSS-2A	8260B-TIC	Unknown	97 J	1.58	carbon dioxide	124-38-9	carbon dioxide
WLSS-2A	8260B-TIC	Unknown	81 J	1.63	carbon disulfide	75-15-0	carbon disulfide
WLSS-2A	8260B-TIC	Unknown	200 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-2A	8260B-TIC	Unknown	1700 J	5.17	hydrazine, trimethyl-	1741-01-1	hydrazine derivative
WLSS-2A	8270C-TIC	Unknown Aldol Condensate	17000 A	2.77	Extraction artifact	- - -	none
WLSS-2A	8270C-TIC	Unknown Alkane	21000 J	4.44	2-propanol, 1-(1-methylethoxy)-	3944-36-3	glycol ether derivative
WLSS-2A	8270C-TIC	Unknown Alcohol	30000 J	6.28	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2A	8270C-TIC	Unknown Organic Acid	3500 J	7.11	2-butenedioic acid, 2,3-dimethyl-, dimethyl ester	13314-92-6	glycol ether derivative
WLSS-2A	8270C-TIC	Unknown	2300 J	7.56	2-butenethioic acid, 3-(ethylthio)-, S-(1-methylethyl) ester	56196-50-0	sulfurated glycol ether
WLSS-2A	8270C-TIC	Unknown Alcohol	17000 J	7.86	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2A	8270C-TIC	Unknown Alkane	6000 J	9.21	butane, 2-ethoxy-	2679-87-0	butyl ether
WLSS-2A	8270C-TIC	Unknown Alkane	3100 J	9.92	vinylcyclooctane	13151-62-7	aliphatic alkane ring
WLSS-2A	8270C-TIC	Unknown	2400 J	16.23	4-hydroxymino-4,5,6,7-tetrahydrobenzofuroxane (surrogate: benzofuroxane)	68100-26-5	benzofuroxane derivative

**TABLE 3**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**WESTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
WLSS-2B	8260B-TIC	Unknown	17 J	1.20	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-2B	8260B-TIC	Unknown	28 J	1.38	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-2B	8260B-TIC	Unknown	160 J	1.51	acetaldehyde	75-07-0	acetaldehyde
WLSS-2B	8260B-TIC	Unknown	51 J	1.58	ethane, methoxy	540-67-0	alkyl ether
WLSS-2B	8260B-TIC	Unknown	12 J	1.72	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-2B	8260B-TIC	Unknown	140 J	5.17	ethane, 1,2-diethoxy	629-14-1	alkyl ether
WLSS-2B	8260B-TIC	Unknown Alkene	5.1 J	6.09	benzene, 1,3-dimethyl-	108-38-3	methyl benzene
WLSS-2B	8260B-TIC	Unknown	21 J	7.02	bicyclo[2.2.2]heptane, 2,2,3-trimethyl-,exo-	20536-41-8	alkyl ring
WLSS-2B	8270C-TIC	Unknown Aldol Condensate	1300 A	2.78	Extraction artifact	- - -	none
WLSS-2B	8270C-TIC	Unknown Aldol Condensate	200 A	2.82	Extraction artifact	- - -	none
WLSS-2B	8270C-TIC	Unknown Alcohol	900 J	3.92	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alcohol	20000 J	4.44	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alcohol	810 J	5.86	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alkane	28000 J	6.29	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alcohol	350 J	7.54	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alcohol	18000 J	7.86	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alcohol	6800 J	9.21	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WLSS-2B	8270C-TIC	Unknown Alkane	1100 J	10.40	butane, 2-ethoxy-	2679-87-0	glycol ether derivative
WLSS-3A	8270C-TIC	Unknown Aldol Condensate	5800 A	2.74	Extraction artifact	- - -	none
WLSS-3A	8270C-TIC	Unknown Amine	2400 J	9.65	1H-Phenanthro[9,10-d]imidazol-2-amine	37052-13-4	imidazole
WLSS-3A	8270C-TIC	Unknown Cycloalkane	2500 J	9.76	bicyclo[2.2.1]heptane, 2,2,3-trimethyl-,endo-	20536-40-7	alkane ring
WLSS-3A	8270C-TIC	Unknown	8200 J	9.89	anthracene, 9-cyclohexyltetradecahydro-	55255-70-4	polycyclic aromatic hydrocarbon
WLSS-3A	8270C-TIC	Unknown Alkene	2700 J	16.45	olean-12-ene	471-68-1	lupenone related

**TABLE 3**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**WESTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
WLSS-3B	8260B-TIC	Unknown	6.4 J	1.20	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-3B	8260B-TIC	Unknown	23 J	1.51	acetaldehyde	75-07-0	acetaldehyde
WLSS-3B	8260B-TIC	Unknown	8.9 J	1.64	carbon dioxide	124-38-9	carbon dioxide
WLSS-3B	8260B-TIC	Unknown	7.4 J	1.66	carbon dioxide	124-38-9	carbon dioxide
WLSS-3B	8260B-TIC	Unknown Alkene	55 J	8.06	1,4-dichlorobenzene-d4	3855-82-1	dichlorobenzene
WLSS-3B	8270C-TIC	Unknown Aldol Condensate	1500 A	2.73	Extraction artifact	- - -	none
WLSS-4A	8260B-TIC	Unknown	250 J	1.19	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-4A	8260B-TIC	Unknown	48 J	1.50	carbon dioxide	124-38-9	carbon dioxide
WLSS-4A	8260B-TIC	Unknown	73 J	1.64	Ethyl chloride	75-00-3	Ethyl chloride
WLSS-4A	8260B-TIC	Unknown	50 J	2.01	carbon dioxide	124-38-9	carbon dioxide
WLSS-4A	8260B-TIC	Unknown	67 J	2.30	carbon disulfide	75-15-0	carbon disulfide
WLSS-4A	8260B-TIC	Unknown	57 J	2.47	carbon dioxide	124-38-9	carbon dioxide
WLSS-4A	8270C-TIC	Unknown Aldol Condensate	5100 A	3.50	Extraction artifact	- - -	none
WLSS-4A	8270C-TIC	Unknown	1300 J	9.77	3,5-Octadiene, 4,5-diethyl-,(z,z)-	21293-03-8	alkyl aromatic ring
WLSS-4A	8270C-TIC	Unknown	2200 J	9.91	9-Octadecyne	35365-59-4	alkyl chain
WLSS-4A	8270C-TIC	Unknown Alkene	3800 J	10.04	5-Octadecene, (E)-	7206-21-5	alkene
WLSS-4ADU	8260B-TIC	Unknown	330 J	1.17	cyclopropyl carbinol	2516-33-8	alkyl ring
WLSS-4ADU	8260B-TIC	Unknown	61 J	1.39	carbon dioxide	124-38-9	carbon dioxide
WLSS-4ADU	8260B-TIC	Unknown Alkene	270 J	8.06	benzene-1,2,3,4-d4, 5,6-dichloro-	2199-69-1	dichlorobenzene
WLSS-4ADU	8270C-TIC	Unknown Aldol Condensate	5000 A	2.74	Extraction artifact	- - -	none
WLSS-4ADU	8270C-TIC	Unknown Cycloalkane	4400 J	9.89	bicyclo[2.2.2]octane, 1,2,3,6-tetramethyl-	62338-45-8	alkyl ring
WLSS-4B	8260B-TIC	Unknown	39 J	1.21	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-4B	8260B-TIC	Unknown	120 J	1.51	carbon dioxide	124-38-9	carbon dioxide
WLSS-4B	8260B-TIC	Unknown	47 J	1.71	Ethyl chloride	75-00-3	Ethyl chloride
WLSS-4B	8260B-TIC	Unknown	12 J	2.74	Propanal, 2-methyl-	78-84-2	alkyl chain
WLSS-4B	8270C-TIC	Unknown Aldol Condensate	1800 A	2.73	Extraction artifact	- - -	none

**TABLE 3**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**WESTERN WHITEWATER LAGOON**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
WLSS-5A	8260B-TIC	Unknown	70 J	1.17	carbon dioxide	124-38-9	carbon dioxide
WLSS-5A	8260B-TIC	Unknown	200 J	1.40	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5A	8260B-TIC	Unknown	130 J	1.51	carbon dioxide	124-38-9	carbon dioxide
WLSS-5A	8260B-TIC	Unknown	71 J	1.67	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5A	8260B-TIC	Unknown	75 J	1.72	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5A	8260B-TIC	Unknown	71 J	2.08	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5A	8260B-TIC	Unknown	72 B	2.47	carbon disulfide	75-15-0	carbon disulfide
WLSS-5A	8260B-TIC	Unknown	400 J	8.06	benzene-1,2,3,4-d4, 5,6-dichloro-	2199-69-1	dichlorobenzene
WLSS-5A	8270C-TIC	Unknown Aldol Condensate	9000 A	2.78	Extraction artifact	- - -	none
WLSS-5A	8270C-TIC	Unknown PAH	2000 J	9.92	Naphthalene, decahydro-1,8a-dimethyl-7-(1-methylethyl)-, [1R-(1.alpha.,4a.bet]	15404-63-4	aromatic ring
WLSS-5B	8260B-TIC	Unknown	12 J	1.20	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5B	8260B-TIC	Unknown	38 J	1.36	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5B	8260B-TIC	Unknown	30 J	1.51	acetaldehyde	75-07-0	acetaldehyde
WLSS-5B	8260B-TIC	Unknown	8.5 J	1.58	carbon dioxide	124-38-9	carbon dioxide
WLSS-5B	8260B-TIC	Unknown	6.9 J	1.73	sulfur dioxide	7446-09-5	sulfur dioxide
WLSS-5B	8260B-TIC	Unknown	7.3 J	2.30	carbon disulfide	75-15-0	carbon disulfide
WLSS-5B	8260B-TIC	Unknown Alkane	16 J	5.17	ethane, 1,2-diethoxy	629-14-1	alkyl ether
WLSS-5B	8270C-TIC	Unknown Aldol Condensate	1500 A	2.78	Extraction artifact	- - -	none
WLSS-5B	8270C-TIC	Unknown Alkane	370 J	3.94	2-butanol, 3-methyl-, (s)	1517-66-4	alkyl alcohol
WLSS-5B	8270C-TIC	Unknown Alkane	450 J	4.45	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
WLSS-5B	8270C-TIC	Unknown Alcohol	240 J	5.86	ethanol, 2-[2-(2-ethoxyethoxyethoxy]-	112-50-5	glycol ether derivative
WLSS-5B	8270C-TIC	Unknown Alkane	990 J	6.29	ethanol, 2-[2-(2-ethoxyethoxyethoxy]-	112-50-5	glycol ether derivative
WLSS-5B	8270C-TIC	Unknown Alcohol	950 J	7.86	ethanol, 2-[2-(2-ethoxyethoxyethoxy]-	112-50-5	glycol ether derivative
WLSS-5B	8270C-TIC	Unknown Alcohol	210 J	9.22	ethanol, 2-[2-(2-ethoxyethoxyethoxy]-	112-50-5	glycol ether derivative

Notes:

ug/Kg = micrograms per kilogram.

TIC = Tentatively Identified Compound.

A = The tentatively identified compound is a suspected aldol-condensation product.

B = The compound / analyte was not detected substantially above the level of the associated method blank / preparation or field blank.

J = The positive result for this analyte is a quantitative estimate.

<sup>1</sup> = The compound/analyte was identified during laboratory processes but determined unknown by a data validator. The analyte was later reidentified.

**TABLE 4**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**OLD LANDFILL AND LANDFILL 156**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
OLF-1	8260B-TIC	Unknown	5.8 J	1.23	carbon dioxide	124-38-9	carbon dioxide
OLF-1	8260B-TIC	Unknown	800 J	7.63	Carbamic acid, methyl-, phenyl ester	1943-79-9	carbamic acid ester
OLF-1	8270C-TIC	Unknown	360 J	12.05	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
OLF-1	8270C-TIC	Unknown <sup>1</sup>	200 JN	12.46	1,1-Bicyclohexyl, 4,4'-dimethyl-	54823-99-3	aromatic ring
OLF-1	8270C-TIC	Unknown <sup>1</sup>	180 JN	12.56	Dibenzo[b,e]-1,4-diazabicyclo[2.2.2]octa	0-00-0	aromatic ring
OLF-1	8270C-TIC	Unknown <sup>1</sup>	170 JN	13.86	D:A-Friedooleanan-7-ol, (7.alpha.)-	18671-57-3	terpene derivative
OLF-1	8270C-TIC	Unknown	330 J	12.85	gamma-sitosterol	83-47-6	sitosterol
OLF-1DUP	8260B-TIC	Unknown	8.3 J	1.01	carbon dioxide	124-38-9	carbon dioxide
OLF-1DUP	8260B-TIC	Unknown	7.3 J	7.63	phenol	108-95-2	phenol
OLF-1DUP	8270C-TIC	Unknown	450 J	14.33	Spiro[7H-indeno[4,5-d]-1,3-dioxole-7,1'(2'H)-isoquinoline]-7'8-diol,3',4',6	30833-09-1	quinoline derivative
OLF-2	8260B-TIC	Unknown	19 J	1.01	ethane, 1,1-difluoro-	75-37-6	fluorinated volatile organic compound
OLF-2	8260B-TIC	Unknown	25 J	1.18	oxirane, ethenyl-	930-22-3	ethylene oxide
OLF-2	8260B-TIC	Unknown	440 J	7.63	Carbamic acid, methyl-, phenyl ester	1943-79-9	carbamic acid ester
OLF-3	8260B-TIC	Unknown	9.6 J	1.01	carbon dioxide	124-38-9	carbon dioxide
OLF-3	8260B-TIC	Unknown	6.4 J	1.18	Ethyl chloride	75-00-3	Ethyl chloride
OLF-3	8260B-TIC	Unknown	120 J	7.63	Carbamic acid, methyl-, phenyl ester	1943-79-9	carbamic acid ester
OLF-3	8270C-TIC	Unknown <sup>1</sup>	190 A	13.65	D-Friedoolean-14-ene, 3-methoxy-, (3.bet	14021-23-9	terpene derivative
OLF-4	8260B-TIC	Unknown	4.8 J	1.18	carbon dioxide	124-38-9	carbon dioxide
OLF-4	8260B-TIC	Unknown	53 J	7.63	phenol	108-95-2	phenol
OLF-4	8270C-TIC	Unknown	1000 J	1.83	cis-2,6-dimethyl-2,6-octadiene	2492-22-0	alkene
OLF-4	8270C-TIC	Unknown <sup>1</sup>	210 JN	13.87	Germanicol	465-02-1	terpene derivative
OLF-5	8260B-TIC	Unknown Alkane	53 J	5.47	cyclopropane, 1-methyl-2-pentyl-	41977-37-1	alkane ring
OLF-5	8260B-TIC	Unknown Alkene	31 J	7.50	benzene-1,2,3,4-d4-, 5,6-dichloro	2199-69-1	dichlorobenzene
OLF-5	8260B-TIC	Unknown	29 J	7.63	phenol	108-95-2	phenol
OLF-5	8270C-TIC	Unknown	1100 J	1.83	cis-2,6-dimethyl-2,6-octadiene	2492-22-0	alkene
OLF-6	8260B-TIC	Unknown	20 J	1.02	ethane, 1,1-difluoro-	75-37-6	fluorinated volatile organic compound
OLF-6	8260B-TIC	Unknown	82 J	7.63	phenol	108-95-2	phenol
OLF-6	8270C-TIC	Unknown	1700 J	1.83	cis-2,6-dimethyl-2,6-octadiene	2492-22-0	alkene
OLF-6	8270C-TIC	Unknown	260 J	9.14	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
OLF-6	8270C-TIC	Unknown <sup>1</sup>	420 J	9.26	Amorphane-B	0-00-0	terpene derivative
OLF-6	8270C-TIC	Unknown <sup>1</sup>	470 J	11.74	Nonadecane	629-92-5	alkane
OLF-6	8270C-TIC	Unknown <sup>1</sup>	790 J	12.49	Hexacosane	630-01-3	alkane
OLF-6	8270C-TIC	Unknown	270 J	13.69	cholestane, 3-ethoxy-, (3.beta.,5.alpha.)	2089-02-3	sitosterol
OLF-6	8270C-TIC	Unknown <sup>1</sup>	280 J	13.86	a-Neogrammacer-22(29)-en-3-ol, (3.beta.,	1678-31-5	sitosterol

**TABLE 4**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**OLD LANDFILL AND LANDFILL 156**

Sample ID	Analytical Method	Analyte	Result (ug/Kg)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
OLF-7	8260B-TIC	Unknown	11 J	7.63	phenol	108-95-2	phenol
OLF-8	8260B-TIC	Unknown	15 J	7.63	phenol	108-95-2	phenol
OLF-8	8270C-TIC	Unknown <sup>1</sup>	250 J	11.75	Heptadecane	629-78-7	alkane
OLF-8	8270C-TIC	Unknown <sup>1</sup>	320 J	12.51	Tetracosane	646-31-1	alkane
OLF-8	8270C-TIC	Unknown	180 J	13.56	gamma-sitosterol	83-47-6	sitosterol

Notes:

ug/Kg = micrograms per kilogram.

TIC = Tentatively Identified Compound.

A = The tentatively identified compound is a suspected aldol-condensation product.

J = The positive result for this analyte is a quantitative estimate.

N = This flag indicates the presumptive evidence of a compound.

<sup>1</sup> = The compound/analyte was identified during laboratory processes but determined unknown by a data validator. The analyte was later reidentified.

**TABLE 5**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**WHITEWATER LAGOON WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
WWL-1	8260B-TIC	Unknown	9.5 J	2.23	sulfur dioxide	7446-09-5	sulfur dioxide
WWL-1	8260B-TIC	Unknown	5.1 J	4.05	silanol, trimethyl-	1066-40-6	alkyl silicon
WWL-1	8260B-TIC	Unknown	34 J	6.51	ethane, 1,2-diethoxy-	629-14-1	glycol ether derivative
WWL-1	8270C-TIC	Unknown	5300 J	5.10	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WWL-1	8270C-TIC	Unknown	9300 J	6.58	silane, dimethyl[(methylsilyl)methyl]-	18148-13-5	alkyl silicon
WWL-1	8270C-TIC	Unknown	930 J	6.60	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
WWL-1	8270C-TIC	Unknown	10000 J	7.71	benzene, 1-methyl-2-(2-propenyl)-	1587-04-8	alkylated benzene
WWL-1	8270C-TIC	Unknown	900 J	7.75	2,5,8,11,14-pentaoxaheptadecan-16-ol	23778-52-1	glycol ether derivative
WWL-1	8270C-TIC	Unknown	460 J	7.86	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
WWL-1	8270C-TIC	Unknown	570 J	7.88	methyl 6-O-acetyl-2,3,4-tri-O-ethyl-.alpha.-D-galactopyranoside (surrogate: 1,6-dichloro-1,6-dideoxy-beta-D-fructofuranosyl-4-chloro-4-deoxy-alpha-D-galactopyranoside)	56038-13-2	galactose derivative
WWL-1	8270C-TIC	Unknown	7800 J	8.66	1,4,7,10,13,16-hexaoxacyclooctadecane	17455-13-9	alkane
WWL-1	8270C-TIC	Unknown	4000 J	9.44	1,4,7,10,13,16-hexaoxacyclooctadecane	17455-13-9	alkane
WWL-1	8270C-TIC	Unknown	1100 J	10.14	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
WWL-2	8260B-TIC	Unknown	6.9 J	1.66	carbon dioxide	124-38-9	carbon dioxide
WWL-2	8260B-TIC	Unknown	5.2 J	1.91	carbon dioxide	124-38-9	carbon dioxide
WWL-2	8260B-TIC	Unknown	5.1 J	1.97	carbon disulfide	75-15-0	carbon disulfide
WWL-2	8260B-TIC	Unknown	14 J	2.16	Extraction artifact	- - -	none
WWL-2	8270C-TIC	Unknown	52 J	4.29	Extraction artifact	- - -	none
WWL-2	8270C-TIC	Unknown	230 J	5.71	2-pentanone, 4-hydroxy-4-methyl	123-42-2	aliphatic alcohol
WWL-2	8270C-TIC	Unknown	330 J	6.07	1-propanol, 3-[3-(1-methylethoxy)propoxy]-	54518-03-5	alcohol ether
WWL-2	8270C-TIC	Unknown	190 J	6.54	hexanoic acid, thio-, S-butyl ester	2432-79-3	sulfurated alkyl acid
WWL-2	8270C-TIC	Unknown	110 J	7.13	2-butenethioic acid, 3-(ethylthio)-, S-(1-methylethyl) ester	56196-50-0	sulfurated alkyl acid
WWL-2	8270C-TIC	Unknown	110 J	7.19	1,1'-oxybis-decane	2456-28-2	alkane ether
WWL-2	8270C-TIC	Unknown	200 J	7.60	1,1'-oxybis-decane	2456-28-2	alkane ether
WWL-2	8270C-TIC	Unknown	76 J	7.94	1,1'-oxybis-decane	2456-28-2	alkane ether
WWL-2	8270C-TIC	Unknown	100 J	8.05	3-Octanol, 2,3-dimethyl-	19781-10-3	alkyl alcohol
WWL-2	8270C-TIC	Unknown	170 J	8.67	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
WWL-3U	8260B-TIC	Unknown	13 B	2.20	Ethyl chloride	75-00-3	ethyl chloride
WWL-3U	8260B-TIC	Unknown	6.4 J	6.51	ethane, 1,2-diethoxy-	629-14-1	glycol ether derivative
WWL-3U	8270C-TIC	Unknown Aldol Condensate	56 B	3.41	Extraction artifact	- - -	none
WWL-3U	8270C-TIC	Unknown	5.1 J	4.04	propanoic acid, 2-hydroxy-, ethyl ester	97-64-3	ethyl lactate
WWL-3U	8270C-TIC	Unknown	6.3 J	4.25	1-propene, 1,2,3-trichloro-	96-19-5	chlorinated volatile organic compound

**TABLE 5**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**WHITEWATER LAGOON WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
WWL-3L	8260B-TIC	Unknown	77 J	2.15	ethyl chloride	75-00-3	Ethyl chloride
WWL-3L	8260B-TIC	Unknown	95 J	2.24	sulfur dioxide	7446-09-5	sulfur dioxide
WWL-3L	8270C-TIC	Unknown Aldol Condensate	49 B	3.41	Extraction artifact	- - -	none
WWL-3L	8270C-TIC	Unknown	8.8 J	3.87	butanedioic acid, mono(2,2-dimethylhydrazide)	1596-84-5	hydrazine derivative
WWL-3L	8270C-TIC	Unknown	17 J	4.05	propane, 2-ethoxy-	625-54-7	2 ethoxy propane
WWL-3L	8270C-TIC	Unknown	8 J	4.25	propane, 1,2,3-trichloro-	96-19-5	chlorinated volatile organic compound
WWL-3L	8270C-TIC	Unknown	12 J	4.59	propane, 2-ethoxy-2-methyl	637-92-3	tert butyl ether
WWL-3L	8270C-TIC	Unknown	4.7 J	5.98	propane, 1,1-diethoxy-	4744-08-5	alkyl ether
WWL-3L	8270C-TIC	Unknown	140 J	6.46	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
WWL-3L	8270C-TIC	Unknown	62 J	7.60	butane, 2-ethoxy-	2679-87-0	ethyl ether
WWL-3L	8270C-TIC	Unknown	18 J	8.55	paraldehyde	123-63-7	cyclic aldehyde

Notes:

ug/L = micrograms per liter.

TIC = Tentatively Identified Compound.

B = The compound / analyte was not detected substantially above the level of the associated method blank / preparation or field blank.

J = The positive result for this analyte is a quantitative estimate.

<sup>1</sup> = The compound/analyte was identified during laboratory processes but determined unknown by a data validator. The analyte was later reidentified.

**TABLE 6**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**MAIN HOLDING BASIN AREA WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
MW-1	8260B-TIC	Unknown	57 J	2.00	carbon dioxide	124-38-9	carbon dioxide
MW-1	8270C-TIC	Unknown Aldol Condensate	49 A	3.43	Extraction artifact	- - -	none
MW-1	8270C-TIC	Unknown	94 J	6.47	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-1	8270C-TIC	Unknown	8.7 J	7.61	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-2	8270C-TIC	Unknown Aldol Condensate	46 A	3.43	Extraction artifact	- - -	none
MW-2	8270C-TIC	Unknown	5.8 J	3.88	butanedioic acid, mono(2,2-dimethylhydrazide)	1596-84-5	hydrazine derivative
MW-2	8270C-TIC	Unknown	20 J	4.06	carbon dioxide	124-38-9	carbon dioxide
MW-2	8270C-TIC	Unknown	14 J	4.60	propane, 2-ethoxy-2-methyl-	637-92-3	alkyl ether
MW-2	8270C-TIC	Unknown	6 J	5.99	1-propanol, 3-[3-(1-methylethoxy)propoxy]-	54518-03-5	ether alcohol
MW-2	8270C-TIC	Unknown	120 J	6.48	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-2	8270C-TIC	Unknown	65 J	7.61	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-2	8270C-TIC	Unknown	18 J	8.56	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-3	8260B-TIC	Unknown	5 B	2.21	sulfur dioxide	7446-09-5	sulfur dioxide
MW-3	8270C-TIC	Unknown Aldol Condensate	60 B	3.42	Extraction artifact	- - -	none
MW-3	8270C-TIC	Unknown	5.3 J	3.56	1-tert-butoxy-2-methoxyethane	66728-50-5	glycol ether derivative
MW-3	8270C-TIC	Unknown	11 J	6.39	2-propanol, 1,1'-(1-methyl-1,2-ethanediyl)bis(oxy)]bis-	1638-16-0	glycol ether derivative
MW-3	8270C-TIC	Unknown	110 J	6.46	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-3	8270C-TIC	Unknown	7.9 J	7.52	sulfur dioxide	7446-09-5	sulfur dioxide
MW-3	8270C-TIC	Unknown	11 J	7.54	2-propanol, 1,1'-(1-methyl-1,2-ethanediyl)bis(oxy)]bis-	1638-16-0	glycol ether derivative
MW-3	8270C-TIC	Unknown	89 J	7.60	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-3	8270C-TIC	Unknown	16 J	7.68	butanedioic acid, ethyl methyl ester	627-73-6	succinic acid derivative
MW-3	8270C-TIC	Unknown	20 J	8.55	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-4	8260B-TIC	Unknown	9.3 B	2.14	benzene, methoxy-	100-66-3	anisole
MW-4	8260B-TIC	Unknown	6.5 J	2.28	carbon disulfide	75-15-0	carbon disulfide
MW-4	8260B-TIC	Unknown	5.2 J	4.05	silanol, trimethyl-	1066-40-6	alkyl silicon
MW-4	8270C-TIC	Unknown Aldol Condensate	56 B	3.41	Extraction artifact	- - -	none
MW-4	8270C-TIC	Unknown	48 J	6.39	propane, 1,2-dimethoxy-	7778-85-0	anisole
MW-4	8270C-TIC	Unknown	370 J	6.47	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-4	8270C-TIC	Unknown	32 J	7.52	1-propanol, 2-(2-methoxyprooxy)-	13588-28-8	glycol ether derivative
MW-4	8270C-TIC	Unknown	37 J	7.54	2-propanol, 1,1'-(1-methyl-1,2-ethanediyl)bis(oxy)]bis-	1638-16-0	glycol ether derivative
MW-4	8270C-TIC	Unknown	260 J	7.60	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-4	8270C-TIC	Unknown	24 J	7.68	butanedioic acid, ethyl methyl ester	627-73-6	succinic acid derivative
MW-4	8270C-TIC	Unknown	82 J	8.55	butane, 2-ethoxy-	2679-87-0	glycol ether derivative
MW-4	8270C-TIC	Unknown	22 J	9.38	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative

**TABLE 6**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**MAIN HOLDING BASIN AREA WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
MW-4U	8260B-TIC	Unknown	5.4 J	1.95	carbon dioxide	124-38-9	carbon dioxide
MW-4U	8270C-TIC	Unknown Aldol Condensate	44 B	3.41	Extraction artifact	- - -	none
MW-4U	8270C-TIC	Unknown	15 J	5.61	ethanol, 2-(2-ethoxyethoxy)-, acetate	112-15-2	glycol ether derivative
MW-4U	8270C-TIC	Unknown	44 J	6.40	2-propanol, 1,1'-(1-methyl-1,2-ethanediyl)bis(oxy)]bis-	1638-16-0	glycol ether derivative
MW-4U	8270C-TIC	Unknown	330 J	6.47	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-4U	8270C-TIC	Unknown	21 J	7.52	2,5,8,11-tetraoxatetradecan-13-ol, 4,7,10-trimethyl-	20324-34-9	glycol ether derivative
MW-4U	8270C-TIC	Unknown	30 J	7.54	2-propanol, 1,1'-(1-methyl-1,2-ethanediyl)bis(oxy)]bis-	1638-16-0	glycol ether derivative
MW-4U	8270C-TIC	Unknown	240 J	7.60	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-4U	8270C-TIC	Unknown	25 J	7.68	butanedioic acid, ethyl methyl ester	627-73-6	succinic acid derivative
MW-4U	8270C-TIC	Unknown	74 J	8.55	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-5	8260B-TIC	Unknown	5.5 B	2.14	3-penten-1-yne, (e)-	2004-69-5	alkene chain
MW-5	8270C-TIC	Unknown	170 J	4.11	carbon disulfide	75-15-0	carbon disulfide
MW-5	8270C-TIC	Unknown	180 J	4.65	propane, 2-ethoxy-2-methyl-	637-92-3	glycol ether derivative
MW-5	8270C-TIC	Unknown	230 J	5.68	ethanol, 1-methoxy-, acetate	4382-77-8	glycol ether derivative
MW-5	8270C-TIC	Unknown	260 J	6.03	propane, 2-ethoxy-2-methyl-	637-92-3	glycol ether derivative
MW-5	8270C-TIC	Unknown	170 J	6.47	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-5	8270C-TIC	Unknown	210 J	7.60	propanoic acid, 3-methoxy-, methyl ester	3852-09-3	glycol ether derivative
MW-5	8270C-TIC	Unknown	180 J	7.85	silane, ethenyltrimethyl-	754-05-2	alkyl silicon
MW-5	8270C-TIC	Unknown	150 J	7.95	1,1'-oxybis-decane	2456-28-2	alkyl ether
MW-5	8270C-TIC	Unknown	140 J	8.00	1,1'-oxybis-decane	2456-28-2	alkyl ether
MW-5U	8270C-TIC	Unknown Aldol Condensate	48 B	3.41	Extraction artifact	- - -	none
MW-5U	8270C-TIC	Unknown	54 J	4.61	propane, 2-ethoxy-2-methyl-	637-92-3	glycol ether derivative
MW-5U	8270C-TIC	Unknown	100 J	5.67	ethanol, 1-methoxy-, acetate	4382-77-8	glycol ether derivative
MW-5U	8270C-TIC	Unknown	110 J	6.01	propane, 1,1,3-triethoxy-	7789-92-6	glycol ether derivative
MW-5U	8270C-TIC	Unknown	160 J	6.46	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-5U	8270C-TIC	Unknown	120 J	7.60	butane, 2-ethoxy-	2679-87-0	glycol ether derivative
MW-5U	8270C-TIC	Unknown	79 J	7.84	methyl 3-(dichloromethyl)-4,4-dichloro-3-butenoate (surrogate: methyl methacrylate)	80-62-6	methyl methacrylate
MW-5U	8270C-TIC	Unknown	83 J	7.94	1,1'-oxybis-decane	2456-28-2	alkyl ether
MW-5U	8270C-TIC	Unknown	85 J	7.99	1,1'-oxybis-decane	2456-28-2	alkyl ether
MW-6	8260B-TIC	Unknown	5.4 B	2.05	carbon disulfide	75-15-0	carbon disulfide
MW-6	8270C-TIC	Unknown Aldol Condensate	55 B	3.42	Extraction artifact	- - -	none
MW-6	8270C-TIC	Unknown	27 J	4.05	carbon disulfide	75-15-0	carbon disulfide
MW-6	8270C-TIC	Unknown	70 J	4.28	ethane, 1,1-diethoxy-	105-57-7	glycol ether derivative
MW-6	8270C-TIC	Unknown	33 J	4.60	propylene glycol	57-55-6	propylene glycol

**TABLE 6**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**MAIN HOLDING BASIN AREA WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
MW-6	8270C-TIC	Unknown	23 J	5.67	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-6	8270C-TIC	Unknown	25 J	6.00	propane, 1,1,3-triethoxy-	7789-92-6	glycol ether derivative
MW-6	8270C-TIC	Unknown	260 J	6.47	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-6	8270C-TIC	Unknown	150 J	7.60	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-6	8270C-TIC	Unknown	52 J	8.55	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-7L	8260B-TIC	Unknown	11 J	2.14	carbon dioxide	124-38-9	carbon dioxide
MW-7L	8270C-TIC	Unknown Aldol Condensate	52 B	3.41	Extraction artifact	- - -	none
MW-7L	8270C-TIC	Unknown	8.3 J	6.46	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-7L	8270C-TIC	Unknown	25 J	7.60	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-7L	8270C-TIC	Unknown	18 J	8.55	butane, 2-ethoxy-	2679-87-0	glycol ether derivative
MW-7U	8260B-TIC	Unknown	5.9 J	2.12	carbon disulfide	75-15-0	carbon disulfide
MW-7U	8270C-TIC	Unknown Aldol Condensate	69 B	3.40	Extraction artifact	- - -	none
MW-7U	8270C-TIC	Unknown	4.1 B	4.24	1-propene, 1,2,3-trichloro-	96-19-5	chlorinated volatile organic compound
MW-7U	8270C-TIC	Unknown	4.1 J	4.56	propane, 2-ethoxy-2-methyl-	637-92-3	glycol ether derivative
MW-7U	8270C-TIC	Unknown	210 J	5.01	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-7U	8270C-TIC	Unknown	28 J	7.57	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-8D	8270C-TIC	Unknown Aldol Condensate	68 B	3.41	Extraction artifact	- - -	none
MW-8D	8270C-TIC	Unknown	4.4 B	4.25	1-propene, 1,1,2-trichloro-	21400-25-9	chlorinated volatile organic compound
MW-8L	8260B-TIC	Unknown	600 J	2.11	2,4-hexadiyne	2809-69-0	alkene
MW-8L	8260B-TIC	Unknown	660 J	2.23	sulfur dioxide	7446-09-5	sulfur dioxide
MW-8L	8270C-TIC	Unknown	50 A	4.48	propane, 2-ethoxy-2-methyl-	637-92-3	glycol ether derivative
MW-8L	8270C-TIC	Unknown	1400 J	4.90	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-8L	8270C-TIC	Unknown	33 J	6.06	2-pentenoic acid, 2-methoxy-4-methyl-, methyl ester	56009-36-0	glycol ether derivative
MW-8L	8270C-TIC	Unknown	48 J	6.25	butyric acid, 3-bromo-, methyl ester	21249-59-2	glycol ether derivative
MW-8L	8270C-TIC	Unknown	890 J	6.33	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-8L	8270C-TIC	Unknown	570 J	7.47	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-8L	8270C-TIC	Unknown	49 J	7.52	2H-1,4-ethanoquinoline, 3,4-dihydro-	4363-25-1	quinoline derivative
MW-8L	8270C-TIC	Unknown	170 J	7.55	4-methoxycarbonylbutyl-1-methyl-2-methoxycarbonylethyl ether (surrogate: ethyl ether)	60-29-7	ethyl ether
MW-8L	8270C-TIC	Unknown	150 J	8.42	butane, 2-ethoxy-	2679-87-0	glycol ether derivative
MW-8L	8270C-TIC	Unknown	34 J	8.51	2-butenedioic acid, 2-methoxy-, dimethyl ester	26579-97-5	glycol ether derivative
MW-8U	8260B-TIC	Unknown	7.1 J	2.13	sulfur dioxide	7446-09-5	sulfur dioxide
MW-8U	8260B-TIC	Unknown	6.6 J	2.27	Extraction artifact	- - -	none
MW-8U	8260B-TIC	Unknown	11 J	4.05	silanol, trimethyl-	1066-40-6	alkyl silicon
MW-8U	8260B-TIC	Unknown	12 J	6.51	ethane, 1,2-diethoxy-	629-14-1	glycol ether derivative

**TABLE 6**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**MAIN HOLDING BASIN AREA WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
MW-8U	8270C-TIC	Unknown Aldol Condensate	50 B	3.41	Extraction artifact	- - -	none
MW-8U	8270C-TIC	Unknown	16 J	4.60	3-heptanol	589-82-2	alkyl alcohol
MW-8U	8270C-TIC	Unknown	18 J	5.61	ethanol, 2-(2-ethoxyethoxy)-, acetate	112-15-2	glycol ether derivative
MW-8U	8270C-TIC	Unknown	17 J	6.39	amylene hydrate	75-85-4	alkyl alcohol
MW-8U	8270C-TIC	Unknown	280 J	6.46	ethane, 1,1-diethoxy-	105-57-7	glycol ether derivative
MW-8U	8270C-TIC	Unknown	170 J	7.60	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-8U	8270C-TIC	Unknown	20 J	7.65	cycloheptanone, oxime	2158-31-8	glycol ether derivative
MW-8U	8270C-TIC	Unknown	62 J	7.68	butanedioic acid, ethyl methyl ester	627-73-6	glycol ether derivative
MW-8U	8270C-TIC	Unknown	49 J	8.55	propane, 1-(1-ethoxyethoxy)-	20680-10-8	glycol ether derivative
MW-9	8260B-TIC	Unknown	5.6 J	1.96	carbon dioxide	124-38-9	carbon dioxide
MW-9	8260B-TIC	Unknown	13 J	2.12	2,4-hexadiyne	2809-69-0	alkene
MW-9	8260B-TIC	Unknown	15 J	4.05	silanol, trimethyl-	1066-40-6	alkyl silicon
MW-9	8260B-TIC	Unknown	14 J	6.51	ethane, 1,2-diethoxy-	629-14-1	glycol ether derivative
MW-9	8270C-TIC	Unknown Aldol Condensate	59 B	3.41	Extraction artifact	- - -	none
MW-9	8270C-TIC	Unknown	7.7 J	3.86	2-ethoxyethyl acetate	111-15-9	glycol ether derivative
MW-9	8270C-TIC	Unknown	9.6 J	4.56	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-9	8270C-TIC	Unknown	4.4 J	4.96	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-9	8270C-TIC	Unknown	16 J	5.61	dimethyl 3,3'-oxydipropanoate (surrogate: 2-oxopropanoate)	113-24-6	glycol ether derivative
MW-9	8270C-TIC	Unknown	230 J	6.46	ethane, 1,1'-oxybis[2-ethoxy-]	112-36-7	glycol ether derivative
MW-9	8270C-TIC	Unknown	35 J	7.59	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-9	8270C-TIC	Unknown	7.4 J	8.55	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-9DUP	8260B-TIC	Unknown	7.2 J	2.14	Extraction artifact	- - -	none
MW-9DUP	8260B-TIC	Unknown	11 J	4.05	silanol, trimethyl-	1066-40-6	alkyl silicon
MW-9DUP	8260B-TIC	Unknown	11 J	6.51	ethane, 1,2-diethoxy-	629-14-1	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown Aldol Condensate	54 B	3.41	Extraction artifact	- - -	none
MW-9DUP	8270C-TIC	Unknown	6.4 J	3.86	2-ethoxyethyl acetate	111-15-9	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown	4.7 J	4.25	1-propene, 1,2,3-trichloro-	96-19-5	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown	6.5 J	4.57	ethanol, 2-(2-ethoxyethoxy)-	111-90-0	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown	4.2 J	4.96	phosphine, trimethyl-	594-09-2	phosphine
MW-9DUP	8270C-TIC	Unknown	12 J	5.61	ethanol, 2-(2-ethoxyethoxy)-, acetate	112-15-2	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown	240 J	6.46	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown	37 J	7.59	ethanol, 2-[2-(2-ethoxyethoxy)ethoxy]-	112-50-5	glycol ether derivative
MW-9DUP	8270C-TIC	Unknown	7.2 J	8.55	ethene, 1,1'-(oxybis(2,1-ethanediyl oxy))bis-	764-99-8	glycol ether derivative

**TABLE 6**  
**SUMMARY OF UNKNOWN TENTATIVELY IDENTIFIED COMPOUNDS**  
**MAIN HOLDING BASIN AREA WELLS**

Sample ID	Analytical Method	Analyte	Result (ug/L)	Retention Time (minutes)	Probable TIC Identity	CAS	Chemical/Chemical Class of TIC
MW-10	8270C-TIC	Unknown Aldol Condensate	54 A	3.42	Extraction artifact	---	none
MW-10	8270C-TIC	Unknown	7.5 J	4.26	propane, 1,1,2,3-tetrachloro-	18495-30-2	chlorinated volatile organic compound

Notes:

ug/L = micrograms per liter.

TIC = Tentatively Identified Compound.

A = The tentatively identified compound is a suspected aldol-condensation product.

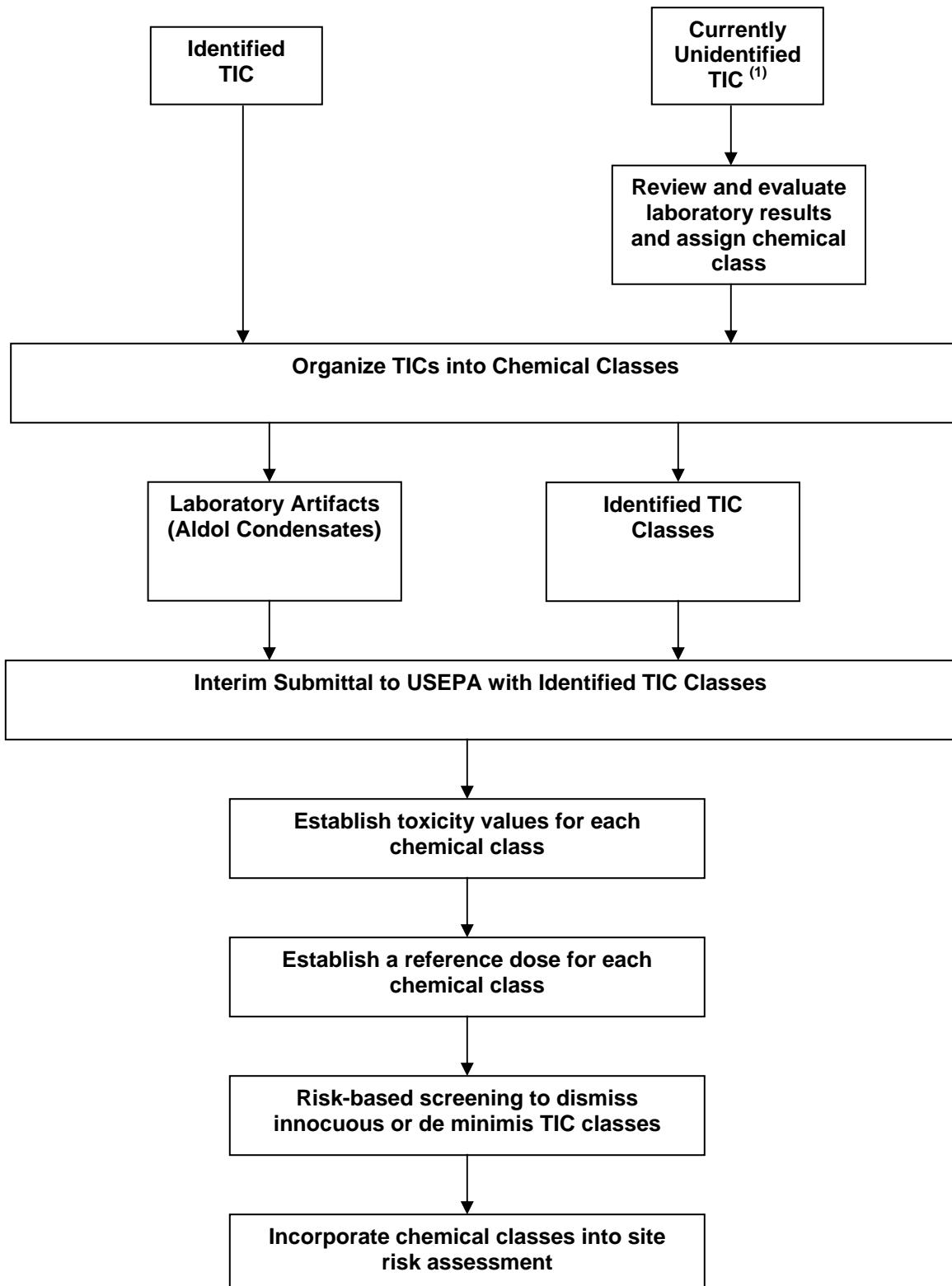
B = The compound / analyte was not detected substantially above the level of the associated method blank / preparation or field blank.

J = The positive result for this analyte is a quantitative estimate.

<sup>1</sup> = The compound/analyte was identified during laboratory processes but determined unknown by a data validator. The analyte was later reidentified.

**ATTACHMENT A**

**TIC CLASS IDENTIFICATION FLOW CHART**  
**HERCULES INCORPORATED, AQUALON DIVISION**  
**HOPEWELL, VIRGINIA**



(1) - USEPA comments on the Phase III Report requested clarification on the specific samples in which TICs were requested to be identified by chemical class.